

## A provisional checklist of the genus *Cepora* (Lepidoptera, Pieridae) from the Sulawesi Region, with descriptions of two new subspecies from Buton Island

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**Abstract** The checklist of the genus *Cepora* from the Sulawesi Region by Vane-Wright and de Jong (2003) is revised based mainly on information from the General Collection of The Natural History Museum, London and the collection of Kyushu University. *Cepora aspasia* is newly recorded from S. E. Sulawesi and two new subspecies of *C. timnatha* and *C. eperia* are described from Buton Island.

**Key words** Pieridae, *Cepora*, Sulawesi, the Sulawesi Region, checklist, Buton.

### Introduction

The genus *Cepora* belongs to the Pieridae, Lepidoptera, and is distributed widely in the Indo-Australian region. This genus, consisting of approximately twenty species, is a well-defined and consistent group. The center of the distribution is Sulawesi and surrounding islands (Yata, 1981). The genus shows a peculiar distribution pattern in the Pieridae and is interesting from the viewpoint of biogeography. Unfortunately, though a temporary grouping has been made, thorough taxonomic research has not yet been attempted. This situation is probably due to the fact that morphological differences of the male genitalia are too delicate to distinguish. Furthermore, species in this genus are highly variable and exhibit many forms probably based on mimicry in addition to seasonal and geographical variations, requiring the reevaluation of species.

As for *Cepora* species occurring in Sulawesi, there are taxonomic studies by Talbot (1932) and Yata (1981), and based on these, Vane-Wright & de Jong (2003) published an annotated checklist of the butterflies of the Sulawesi Region, which was originally planned in connection with *Project Wallace*, 1985. According to Vane-Wright & de Jong (2003) eight *Cepora* species have been recorded from the Sulawesi Region, with five endemic to the Region. Since then, two more subspecies, *C. celebensis kazuyoe* and *C. fora milos* were described from Buton Island by Watanabe (1987). In the course of our taxonomic study on the genus *Cepora*, we found several new taxa and new records from the Region. Among them we give here three new records of *Cepora* species and describe two new subspecies of *C. timnatha* and *C. eperia* from Buton Island.

We also present a provisional checklist of *Cepora* species from the Region based mainly on the annotated checklist by Vane-Wright & de Jong (2003) and on information from the General Collection of The Natural History Museum, London and the collection of Kyushu University.

### Materials and methods

Material used was mainly from the collection of the Biosystematics Laboratory, Faculty of Social and Cultural Studies, Kyushu University, Fukuoka (BLKU). Type and additional specimens were from The Natural History Museum, London (NHM), and amateur Lepid-

opterists.

For detailed examination of male genitalia, segments were cut, placed in a 10% solution of KOH at 90°C for 15–30 minutes, and observed in distilled water. Dissection and observation were carried out under a binocular microscope.

## Results

### A provisional checklist of *Cepora* in the Sulawesi Region

The following checklists are based mainly on that of Vane-Wright & de Jong (2003).

#### *Cepora timnatha* Hewitson, 1862

- *C. timnatha timnatha* Hewitson, 1862  
Range. Sulawesi (N): Manado, Doluduo, Donggala. Sulawesi (C).
- *C. timnatha filia* (Fruhstorfer, 1902)  
Range. Sulawesi (S): Palopo, Maros, Bantimurung, Bantaeng.
- *C. timnatha* subsp. (Roos, 1995)  
Range. Sulawesi (SE).
- *C. timnatha aurulenta* (Fruhstorfer, 1899)  
Range. Peleng.
- *C. timnatha soror* (Fruhstorfer, 1899)  
Range. Sula: Besi.
- *C. timnatha filiola* Fruhstorfer, 1899  
Range. Sula: Mangole.
- *C. timnatha* **ssp. nov.**  
Range. Buton: Baubau (**new record/new subspecies**).

#### *Cepora celebensis* (Rothschild, 1892)

- *C. celebensis celebensis* (Rothschild, 1892)  
Range. Sulawesi (N): Manado, Doluduo, Tolitoli; Sulawesi (S): Palopo, Camba, Bantimurung, Makassar; Sulawesi (SE): Asera; Salayar; Peleng.
- *C. celebensis kazuyoe* Watanabe, 1987  
Range. Lewele, Buton: Baubau.

#### *Cepora eurygonia* Hopffer, 1874

- *C. eurygonia* Hopffer, 1874  
Range. Kep. Togian.

#### *Cepora perimale* (Donovan, 1805)

- *C. perimale* subsp. (Jurriaanse & Lindemans, 1920)  
Range. Muna (Galla).
- *C. perimale tuekangbesiensis* Jurriaanse & Lindemans, 1920  
Range. Kep. Tukangbesi; Buton: Baubau (**new record**).
- *C. perimale kuehni* (Röber, 1885)  
Range. Salayar.

#### *Cepora iudith* (Fabricius, 1787)

- *C. iudith* subsp. (Zoologische Sammlung des Bayerische Staates, München (ZSBS); de Jong *in litt.*, Hausmann *in litt.*)  
Range. Sulawesi (N).

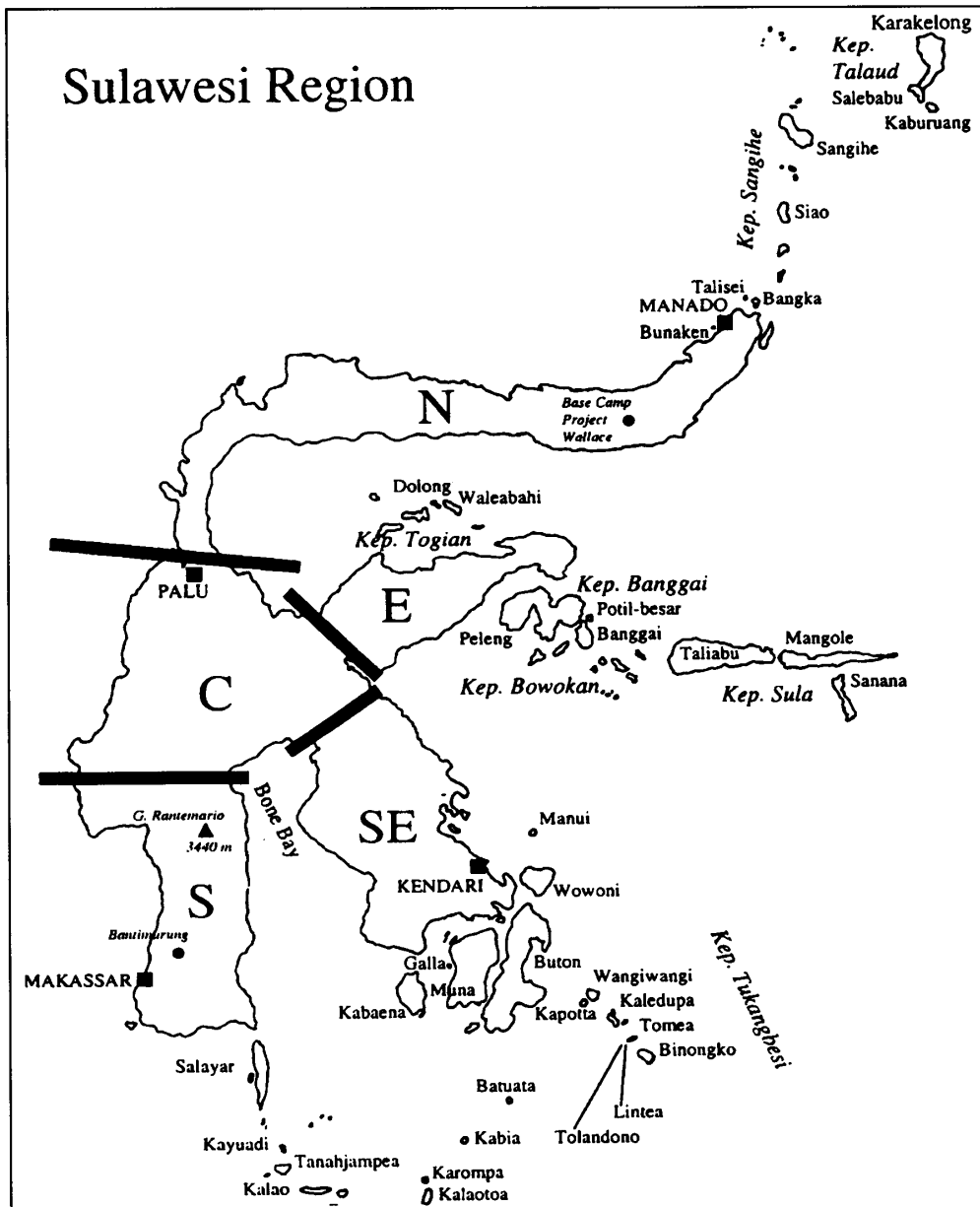


Fig. 1. The Sulawesi Region (Vane-Wright &amp; de Jong, 2003).

*Cepora aspasia* (Stoll, 1790)

— *C. aspasia talaudensis* Niepelt, 1926  
Range. Kep. Talaud.

— *C. aspasia jael* (Wallace, 1867)  
Range. Sulawesi (SE): Asera (**new record**).

*Cepora eperia* (Boisduval, 1836)

— *C. eperia eperia* (Boisduval, 1836)  
Range. Sulawesi (S): Camba, Bantimurung, Makassar.

— *C. eperia* subsp.

Table 1. Record of species of *Cepora* in the Sulawesi Region. Recorded species are shown by black circle (=●), and newly recorded ones are by black diamond (=◆). For abbreviations "N", "C", "E", "S" and "SE", see Fig. 1. Others are surrounding areas.

Region	N	C	E	S	SE	Togian	Talaud	Salayar	Peleng	Sula	Buton	Muna	Tukangbesi
<i>celebensis</i>	●			●	●			●	●		●		
<i>eperia</i>	●			●					◆		◆		
<i>timnatha</i>	●	●		●	●				●	●	◆		
<i>fora</i>	●			●							●		
<i>iudith</i>	●												
<i>eurygonia</i>						●							
<i>aspasia</i>					◆		●						
<i>perimale</i>								●			◆	●	●
Total	5	1	0	4	3	1	1	2	3	1	5	1	1

Range. Peleng (new record).

— *C. eperia* subsp. nov.

Range. Buton: Baubau (new record/new subspecies).

*Cepora fora* (Fruhstorfer, 1897)

— *C. fora papayatana* Watanabe, 1987

Range. Sulawesi (N): Papayat.

— *C. fora fora* (Fruhstorfer, 1897)

Range. Sulawesi (S): Bantimurung, Bantaeng.

— *C. fora milos* Watanabe, 1987

Range. Lewele, Buton: Baubau.

This checklist includes five newly recorded species and two (from Baubau, Buton Is.) of them are recognized as new subspecies. Diversity (distribution) of species based on checklist is shown in Table 1.

### Description of subspecies from Buton Island

#### *Cepora timnatha butona* subsp. nov.

This new subspecies is similar to *C. timnatha filia* from S. Sulawesi, but distinguished by the following combination of features.

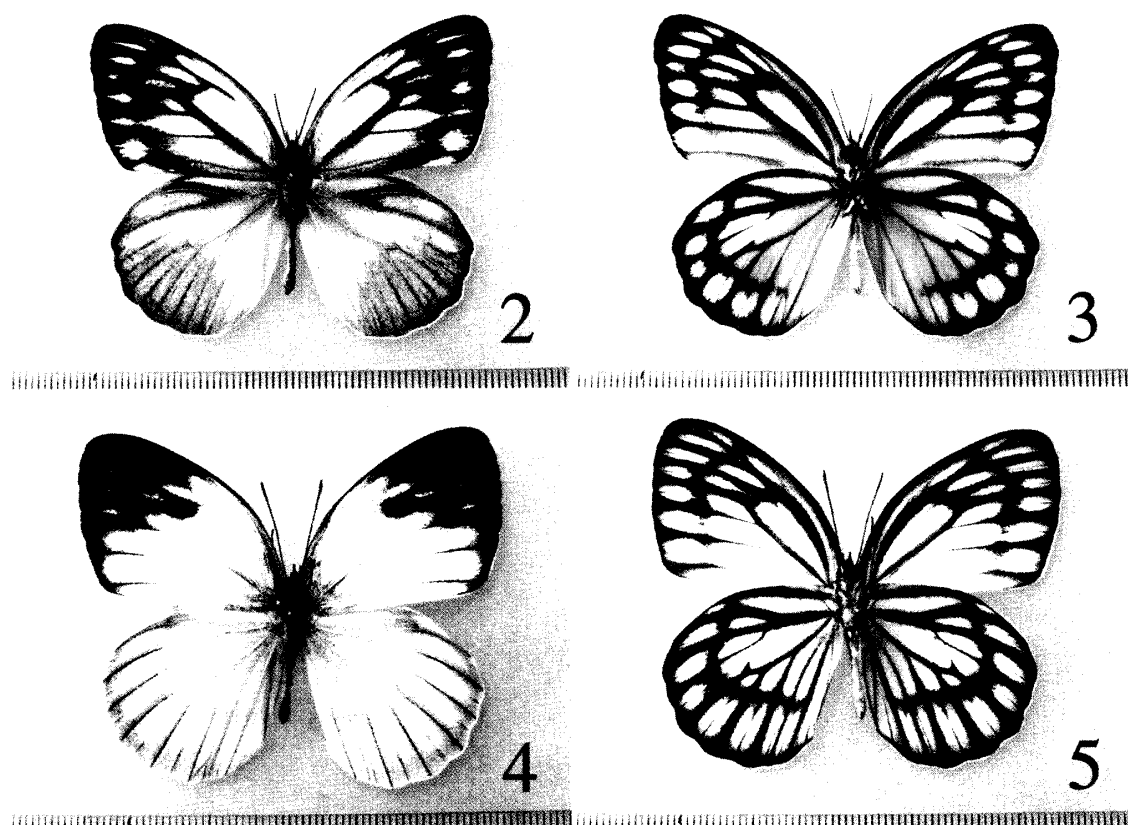
Male (Figs 2–3). *Upperside*: Forewing marginal black band broader; submarginal black band obviously more developed, extending well along veins especially between veins 3 and 9, always appearing in space 2; by contrast, a series of submarginal white spots between marginal and submarginal bands diminishing. Hindwing more heavily and extensively dusted with gray scales. *Underside*: Forewing marginal and submarginal black bands somewhat better developed, extending well along veins especially between veins 3 and 9. Forewing costa in spaces 7 to 12 usually greenish yellowish; hindwing basal half entirely darker orange, usually yellowish in series of marginal white spots.

Forewing length. 31.1–34.9 mm ( $n=7$ , avg=33.3 mm).

Male genitalia (Fig. 6). Although *Cepora timnatha* shows some individual variation, especially for uncus and phallus, this subspecies is within the range of variation.

Type locality. Baubau, Buton Island, Indonesia.

Distribution. This subspecies is restricted to Buton Island.



Figs 2-5. *Cepora* spp. 2-3. *C. timnatha butona* ssp. nov. 2. Male, upperside (Baubau, Buton Is.).  
3. Ditto, underside. 4-5. *C. eperia flava* ssp. nov. 4. Male, upperside (Baubau, Buton Is.).  
5. Ditto, underside.

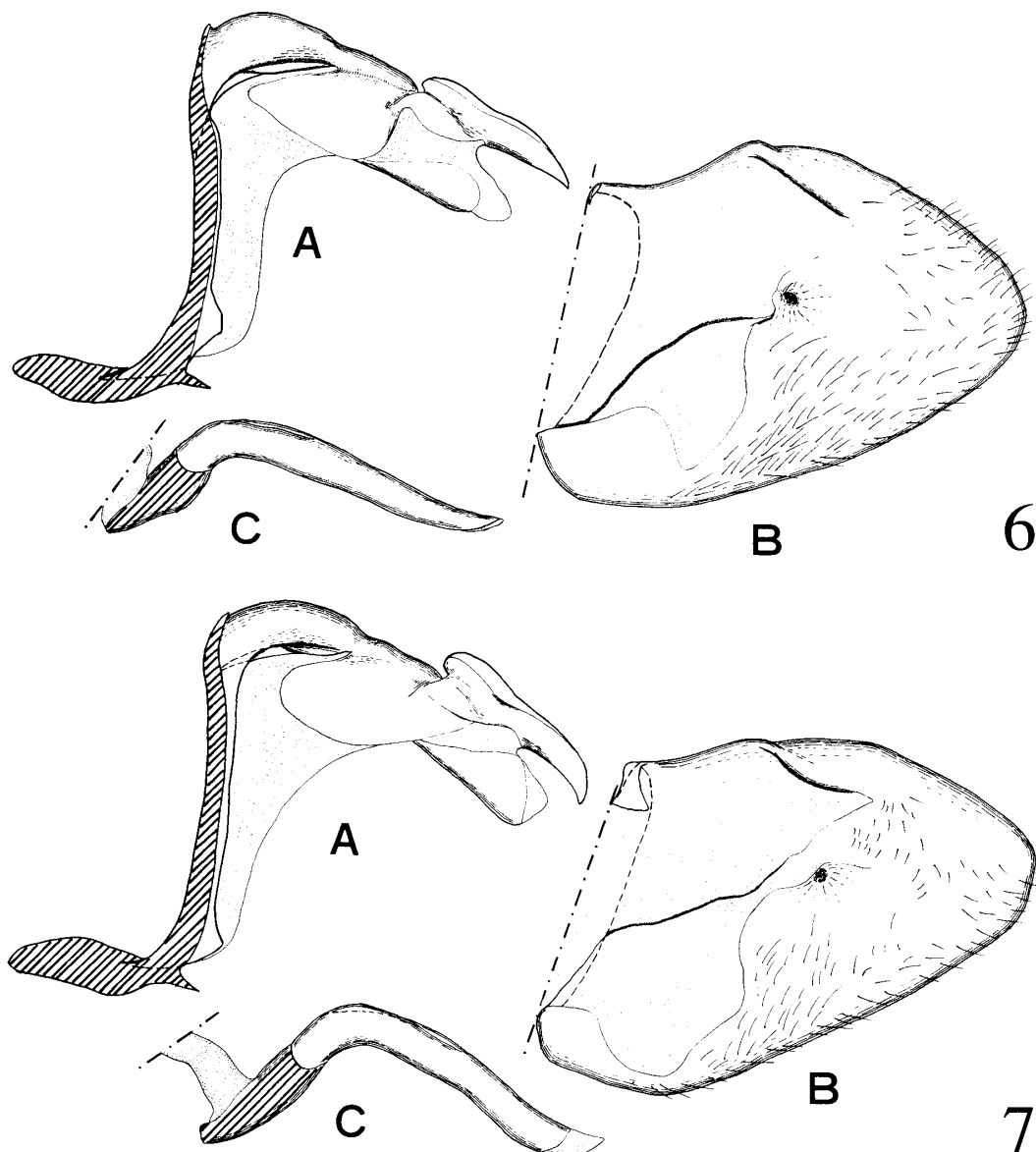
Holotype. ♂, Indonesia, Buton Island, Baubau, iii. 1999, Y. Nishiyama collection [BLKU].  
Paratypes. 7 ♂, same data as holotype [BLKU].

Remarks. This new subspecies is similar to *C. timnatha filia* from S. Sulawesi, but distinguishable by a more developed submarginal black band on forewing upperside, and the hindwing upperside being more strongly dusted with gray scales.

***Cepora eperia flava* subsp. nov.**

This new subspecies is distinguished from the nominotypical subspecies *eperia* from N. Sulawesi by the following combination of features.

Male (Figs 4-5). *Upperside*: Forewing marginal black band broader; submarginal black band obviously better developed, extending well along veins especially between veins 3 and 9; by contrast, a series of submarginal white slits between marginal and submarginal bands barely traceable; roundish discocellular spot better developed, connected by distinct and broader black vein 5 with submarginal black band. *Underside*: Forewing marginal and submarginal black bands somewhat better developed, extending well along veins especially between veins 3 and 9. Forewing costa in spaces 7 to 12 usually greenish yellowish. Hindwing basal half more extensively lemon yellow, as a result space 7 entirely occupied by lemon yellow and series of marginal white ground spots always pale yellowish.



Figs 6–7. Male genitalia of *Cepora* spp. 6. *C. timnatha butona* ssp. nov. 7. *C. eperia flava* ssp. nov. A: Ring (lateral). B: Inner surface of valva (lateral). C: Phallus (lateral).

Forewing length. 32.1–36.7 mm ( $n=7$ , avg=34.5 mm).

Male genitalia (Fig.7). Although *Cepora eperia* shows some individual variation, especially for uncus and phallus, it is within the range of intrasubspecific variation.

Type locality. Baubau, Buton Island, Indonesia.

Distribution. This subspecies is restricted to Buton Island.

Holotype. ♂, Indonesia, Buton Island, Baubau, iii. 1999, Y. Nishiyama collection [BLKU].  
Paratypes. 7 ♂, same data as holotype [BLKU].

Remarks. This new subspecies is similar to the nominotypical subspecies, *C. eperia* in S. Sulawesi, but distinguishable by the better developed discocellular spot, connected by a distinct and broader black vein 5, the hindwing basal half being more extensively paler lemon

yellow, and as a result space 7 being entirely occupied by lemon yellow and the series of marginal white ground spots always being pale yellowish.

### New localities of three other species from the Sulawesi Region

*C. aspasia jael* (Wallace, 1867) (SE. Sulawesi)

4 ♂ 2 ♀, Indonesia, S. E. Sulawesi, Asera, v. 2000, ex Y. Nishiyama collection [BLKU].

Specimens of *C. aspasia* newly recorded from SE. Sulawesi were compared with those in the Collections of Kyushu University and NHM. We could not distinguish them from the subspecies *C. aspasia jael* from Buru. Considering the fact that *C. aspasia* often flies long distance and that SE. Sulawesi is within 500 km, we can easily guess that these new records are temporary immigrants flying from Buru.

*C. perimale tuekangbesiensis* Jurriaanse & Lindemans, 1920 (Baubau, Buton)

2 ♂, Indonesia, Buton Is., Baubau, iii. 1999, ex Y. Nishiyama collection [BLKU].

Newly recorded specimens from Buton were compared with those from Binongko Island, Kep. Tukangbesi. Definite differences of wing pattern could not be found. Furthermore, because the two islands are very close to each other, we considered that these new records belong to the subspecies *C. perimale tuekangbesiensis*.

*C. eperia* ssp. (Peleng)

6 ♂, Indonesia, Peleng Is., v. 1989, ex Y. Nishiyama collection [BLKU].

Newly recorded males from Peleng are very similar to the nominotypical subspecies from Sulawesi. We cannot judge whether or not they represent a separate subspecies because of insufficient material.

### Discussion

The genus *Cepora* is diverse all over the Sulawesi Region and most rich in species in Sulawesi. Among specimens examined on this occasion, we discovered several new records including two new subspecies. When these new records are added, five species are distributed in Buton Is. as in Sulawesi Is. Since The Natural History Museum, London does not possess many *Cepora* specimens from Buton Is., it is possible that further new records and new taxa will be found from this island in the near future. Taxonomic revision of the genus *Cepora* is needed. In order to achieve this, detailed investigations of distribution are needed in and around the Sulawesi Region.

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## 摘 要

スラウェシ産 *Cepora* 属と2新亜種の記載 (岩崎浩明・矢田 脩)

*Cepora* 属はインド-オーストラリア地域に広く分布するシロチョウ科で、現在までに約20種が知られている。*Cepora* 属の分布の中心はスラウェシ島であるが、シロチョウ科としては例外的な分布パターンであり興味深い。

大英自然史博物館と九州大学収蔵の標本、及び、データに基づいて *Cepora* 属の分布情報を集め、Vane-Wright & de Jong (2003) によるスラウェシ地域 (The Sulawesi Region) における同属のチェックリストの再検討を行った。その結果、*Cepora* 属5種の新産地が見出された。そのうちブトン島 Buton から得られた *C. timnatha* と *C. eperia* は新亜種として記載した。スラウェシ島から得られた *C. aspasia* についてはブル島産の *C. aspasia jael* と同亜種と見なし、ブトン島から得られた *C. perimale* はトカンベシ諸島 Kep. Tukangbesi から知られる *C. perimale toekangbesiensis* と同じ亜種であると判断した。新産地から得られた種を含めると、従来はスラウェシ島における *Cepora* 属の種の多様性が最も高かったが、ブトン島も同様に *Cepora* の種が多く分布している地域であることがわかった。

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